WHAT IS CLAIMED IS:

1. A semiconductor film, comprising:

a substrate; and

a graded gallium nitride layer deposited on the substrate having a varying composition of a substantially continuous grade from an initial composition to a final composition formed from a supply of at least one precursor in a growth chamber without any interruption in the supply.

2. The semiconductor film of claim 1, wherein the graded gallium nitride layer is deposited using metalorganic chemical vapor deposition (MOCVD).

3. The semiconductor film of claim 1, wherein the graded gallium nitride layer has a net compressive stress.

4. The semiconductor film of claim 1, wherein the graded gallium nitride layer is deposited by changing a vapor pressure of the supply of at least one precursor in a growth chamber for the graded gallium nitride layer.

5. The semiconductor film of claim 1, wherein the precursor is gallium, aluminum or nitrogen.

6. The semiconductor film of claim 1, wherein the graded gallium nitride layer is deposited by changing a parameter of the growth chamber for the graded gallium nitride layer.

7. The semiconductor film of claim 6, wherein the parameter of the growth chamber is a total pressure, a temperature of the substrate, a total flow, a rate of substrate rotation or a reactor wall temperature.

8. The semiconductor film of claim 1, wherein the graded gallium nitride layer is deposited by changing the geometry of the growth chamber for the graded gallium nitride layer.

9. The semiconductor film of claim 8, wherein changing the geometry of the growth chamber comprises moving the substrate relative to injectors of the growth chamber.

10. The semiconductor film of claim 1, wherein the substrate is silicon or silicon carbide.

11. The semiconductor film of claim 1, wherein the initial composition is a high aluminum composition.

12. The semiconductor film of claim 1, wherein the initial composition is aluminum nitride or a high aluminum content aluminum gallium nitride.

13. The semiconductor film of claim 1, wherein the final composition is a low aluminum composition.

14. The semiconductor film of claim 1, wherein the final composition is gallium nitride or a low aluminum content aluminum gallium nitride.

15. The semiconductor film of claim 1, further comprising at least one additional layer disposed on the graded gallium nitride layer.

16. The semiconductor film of claim 1, wherein at least one other element is introduced into the growth chamber for the graded gallium nitride layer causing no abrupt variations in the varying composition of the graded gallium nitride layer.

17. The semiconductor film of claim 16, wherein the other element is silicon, indium or arsenic.

18. A method of producing a semiconductor film, comprising:

providing a substrate; and

depositing a graded gallium nitride layer on the substrate having a varying composition of a substantially continuous grade from an initial composition to a final composition formed from a supply of at least one precursor in a growth chamber without any interruption in the supply.

19. The method of claim 18, wherein the step of depositing the graded gallium nitride layer comprises using metalorganic chemical vapor deposition (MOCVD).

20. The method of claim 18, wherein the step of depositing the graded gallium nitride layer produces a graded gallium nitride layer having a net compressive stress.

21. The method of claim 18, wherein the step of depositing the graded gallium nitride layer comprises changing a vapor pressure of the supply of at least one precursor in a growth chamber for the graded gallium nitride layer.

22. The method of claim 18, wherein the precursor is gallium, aluminum or nitrogen.

23. The method of claim 18, wherein the step of depositing the graded gallium nitride layer comprises changing a parameter of the growth chamber for the graded gallium nitride layer.

24. The method of claim 23, wherein the parameter of the growth chamber is a total pressure, a temperature of the substrate, a total flow, a rate of substrate rotation or a reactor wall temperature.

25. The method of claim 18, wherein the step of depositing the graded gallium nitride layer comprises changing the geometry of the growth chamber for the graded gallium nitride layer.

26. The method of claim 25, wherein changing the geometry of the growth chamber comprises moving the substrate relative to injectors of the growth chamber.

27. The method of claim 18, wherein the substrate is silicon or silicon carbide.

28. The method of claim 18, wherein the initial composition is a high aluminum composition.

29. The method of claim 18, wherein the initial composition is aluminum nitride or a high aluminum content aluminum gallium nitride.

30. The method of claim 18, wherein the final composition is a low aluminum composition.

31. The method of claim 18, wherein the final composition is gallium nitride or a low aluminum content aluminum gallium nitride.

32. The method of claim 18, further comprising depositing at least one additional layer on the graded gallium nitride layer.

33. The method of claim 18, wherein the step of forming the graded gallium nitride layer comprises introducing at least one other element into the growth chamber for the graded gallium nitride layer causing no abrupt variations in the varying composition of the graded gallium nitride layer.

34. The method of claim 33, wherein the other element is silicon, indium or arsenic.